



West Nile Virus

ProtectTexasTM
Texas Department of Health

West Nile virus settles into Texas landscape



Much like the uninvited houseguest who unpacks and never leaves, West Nile virus has come to Texas to stay.

“West Nile virus first appeared in Texas in June 2002 and has since moved across the state,” said Joe Garrett, a veterinarian with the zoonosis control division at the Texas Department of Health (TDH). “We probably should consider West Nile virus endemic to the state now, much like St. Louis encephalitis is permanently established in Texas,” Garrett said. “But West Nile virus is new to us, and we still are trying to understand it. We cannot predict what kind of a season we will have this year.”

In 2002, West Nile virus was reported in 213 Texas counties. A total of 202 serious West Nile cases, including 13 deaths, were reported in humans. The virus also was identified in 1,697 horses and 518 birds.

The TDH Laboratory tested more than 160,000 mosquitoes in 7,350 groups or pools last year for a variety of mosquito-borne infections including West Nile virus; St. Louis encephalitis; and Western, Eastern and Venezuelan equine encephalitis. Of these mosquito pools, 466 of them were positive for a variety of mosquito-borne viruses and 189 pools were positive for West Nile virus.

Mosquitoes generally are collected and tested from May through November, but several areas in the state have year-round surveillance.

“Testing mosquitoes and dead birds — generally jays, crows and hawks — gives us a way of actively tracking the virus to alert affected communities that they may need to take precautions to protect themselves,” Garrett said. “Tracking illnesses in humans and horses also gives us a more complete picture of the spread of the virus.”

Mosquitoes get the West Nile virus by biting infected birds. People and animals get West Nile from the bite of an infected mosquito, not from other people, animals or birds.



West Nile virus infections usually are mild with flu-like symptoms including fever, headache, sore throat, body aches and fatigue, occasionally with skin rash and swollen lymph glands. Symptoms of more severe West Nile infections — encephalitis and meningitis — include headache, high fever, stiff neck, disorientation, tremors, convulsions, muscle weakness, coma and paralysis. If you have these symptoms, contact your health care provider right away.

The incubation period for West Nile virus is three to 14 days. Mild symptoms may last a few days while symptoms of the more severe illness may last several weeks. Neurological effects may be permanent, and West Nile can be fatal. Fewer than 1 percent of those bitten by infected mosquitoes become severely ill.

Currently no vaccine is available to combat West Nile virus in people, and no specific treatment is given for the infection other than supportive therapies for fever or pain. “People can, however, do a great deal to protect themselves, their families and their communities,” said Dr. Eduardo Sanchez, Texas Commissioner of Health. “Reducing exposure to mosquitoes is one of the most important things.”

Dr. Sanchez urged people to remember the four D’s:

Dusk to Dawn

Stay indoors from dusk to dawn, times when those mosquitoes likely to carry the infection are most active.

Dress

Dress in pants and long sleeves when you are outside, especially in mosquito-infested areas.

DEET (N,N-diethyl-m-toluamide)

Apply insect repellent that contains DEET. Read and follow label instructions. Spray both exposed skin and clothing with repellent.

Drain

Get rid of standing water in your yard and neighborhood. Old tires, flowerpots, clogged rain gutters, leaky pipes and faucets, birdbaths and wading pools can be breeding sites for mosquitoes.



Garrett said it also is important to keep mosquitoes out of the house. “Be sure door, porch and window screens are in good condition,” he said.

Cities, counties, mosquito control districts or local health departments will implement pesticide application if they consider such action appropriate for their communities.

“West Nile virus can infect just about any animal from alligators to zebras,” Garrett said, “but most do not become sick..”

Horses, however, seem to be most susceptible to the infection, the veterinarian noted. “A vaccine that is about 95 percent effective in preventing West Nile in horses is available,” Garrett said. “Horses not previously immunized need two shots given three to six weeks apart, with a annual booster thereafter. Protection begins about three to four weeks after the last shot.”

Even if horses were vaccinated late last year, Garrett advises that the animals be given the booster shot now rather than waiting a full year.

West Nile virus was originally detected in Uganda in 1937. It was first identified in the United States in New York in 1999 and has since spread westward and southward across the country to 44 states and the District of Columbia. A total of 4,008 human cases were recorded nationwide by the end of last year.

TDH operates a toll-free line in English and Spanish — 888-883-9997 — providing information on dead bird testing, mosquito surveillance and other West Nile virus topics. Additional information, statistics and maps are available by clicking on the West Nile virus information link on the TDH Web site at www.tdh.state.tx.us.



What you need to know about WEST NILE VIRUS

What is it?

West Nile virus is a virus commonly found in Africa, West Asia and the Middle East. It is not known how long it has been in the United States, but the Centers for Disease Control and Prevention (CDC) believe the virus probably has been in the eastern United States since early summer 1999. It is closely related to St. Louis encephalitis virus found in the United States. The virus can infect humans, birds, mosquitoes, horses and some other animals.

How can I reduce my risk of getting West Nile virus?

Preventing mosquito bites is the best way to avoid getting West Nile virus. Remember the “Four Ds;” DEET, Dress, Dusk and Dawn, and Drain:

1. Apply insect repellent that contains DEET (N, N-diethyl-m-toluamide). Be sure to read label instructions. Spray clothing with repellent as well as exposed skin.
2. Dress in long sleeves and long pants when you are outside.
3. Stay indoors at dusk and dawn, times infected mosquitoes are most active.
4. Drain standing water in your backyard and neighborhood; old tires, flower-pots and clogged rain gutters are mosquito-breeding sites.

What are the symptoms?

Most people infected with West Nile virus will not have any signs of illness. Twenty percent of people who become infected will have mild symptoms such as fever, headache, body aches and occasionally a skin rash on the trunk of the body and swollen lymph glands.

The symptoms of severe infection (West Nile encephalitis or meningitis) include headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness and paralysis. Only about one out of 150 people infected with West Nile virus will develop this more severe form of the disease.

The incubation period of West Nile virus in humans is three to 14 days. Symptoms of mild disease may last a few days. Symptoms of severe disease may last several weeks, although neurological effects may be permanent. Rarely, death can occur.



How is it spread?

West Nile virus is spread by the bite of an infected mosquito and can infect people, horses, many types of birds and some other animals. There is no evidence that West Nile virus can be spread from person to person or from animal to person, *except by mosquito bite*.

Who is at risk for West Nile virus?

People over 50 years of age have the highest risk of severe disease. It is not known if people with weakened immune systems are at an increased risk for West Nile virus.

How is West Nile virus treated?

There is no specific treatment for West Nile virus infection. In severe cases, intensive supportive therapies are indicated, such as intravenous fluids and medicine to control fever or pain. Antibiotics may be given for any secondary bacterial infection.

Can I be vaccinated for West Nile virus?

Currently there is no vaccine for West Nile virus, but several companies are working toward developing a vaccine.

Is this a seasonal virus?

West Nile encephalitis cases usually occur in the late summer or early fall. However, Texas has a variety of climates; and when temperatures are mild, West Nile virus can be transmitted year round. It is best to try to protect yourself all year.

How likely am I to be bitten by an infected mosquito?

Less than 1 percent of those bitten by infected mosquitoes become severely ill. If you have the symptoms mentioned on this flyer, contact your doctor immediately.

Where can I get more information?

Contact your local health department. West Nile virus information can be found on the Texas Department of Health Web site at www.tdh.state.tx.us and the CDC Web site at: www.cdc.gov/ncidod/dvbid/westnile/index.htm.



Lo que usted debe saber acerca. . .

El virus West Nile **[Virus del Nilo Occidental]**

¿Qué es este virus?

El virus West Nile es un virus que comúnmente se encuentra en África, Asia Occidental y en el Medio Este. No se sabe cuánto tiempo ha estado el virus en los Estados Unidos pero los U.S. Centers for Disease Control and Prevention (CDC) [Centros para el Control y la Prevención de Enfermedades de EU] piensan que el virus probablemente ha estado en la región este de los Estados Unidos desde el principio del verano de 1999. Este virus está relacionado muy cerca al virus de encefalitis de St. Louis que se encontró en los Estados Unidos. El virus puede infectar a humanos, pájaros, zancudos, caballos y algunos otros animales.

¿Cómo puedo yo reducir el riesgo de contraer el virus West Nile?

El prevenir las picaduras de zancudos es la mejor manera de evitar la contracción del virus West Nile. Recuerde las siguientes recomendaciones:

1. Utilice el repelente para insectos que contiene DEET (N, N-diethyl-m-toluamide). Asegúrese de leer las instrucciones de la etiqueta y rocíe con el repelente las ropas al igual que su piel expuesta.
2. Debe usar pantalones y camisas de manga larga cuando esté a la intemperie.
3. Permanezca dentro de la casa al anochecer y al amanecer. Estas son las horas cuando los zancudos infectados se encuentran más activos.
4. Desagüe las aguas estancadas de su patio y vecindario, en llantas viejas, macetas y canales de desagüe tapados. Estos son los lugares donde se crían los zancudos.

¿Cuáles son los síntomas?

La mayor parte de la gente infectada con el virus West Nile no darán indicación alguna de tener la enfermedad. El 20% de las personas quienes resultan infectadas tendrán síntomas leves que incluyen fiebre, dolor de cabeza, dolores del cuerpo y de vez en cuando una urticaria en el tronco del cuerpo y las glándulas linfáticas hinchadas.

Los síntomas de infección severa (encefalitis o meningitis West Nile) incluyen dolor de cabeza, fiebre alta, rigidez en el cuello, estupor, desorientación, un estado de coma, estremecimientos, convulsiones, debilidad de músculos y parálisis. Solamente una de 150 personas infectadas con el virus West Nile desarrollarán esta forma más severa de la enfermedad.



El período de incubación del virus West Nile en los humanos es de tres a 14 días. Los síntomas de una enfermedad leve podrían durar unos días. Los síntomas de una enfermedad severa podrían durar varias semanas, aunque los efectos neurológicos podrían ser permanentes. Raramente la muerte puede ocurrir.

¿Cómo es que el virus se propaga?

El virus West Nile es propagado por la picadura de un zancudo infectado y estas picaduras pueden infectar a las personas, a caballos, a muchas clases de pájaros y a otros animales. No existe evidencia que el virus West Nile puede ser propagado de persona a persona o de un animal a una persona.

¿Quién está expuesto al riesgo del virus West Nile?

Las personas de más de 50 años de edad están bajo un mayor riesgo de padecer esta enfermedad severa. Se desconoce si las personas con sistemas inmunodeficientes débiles enfrentan un mayor riesgo del virus West Nile.

¿Qué tratamientos hay para el virus West Nile?

No existe ningún tratamiento específico para la infección del virus West Nile. En casos severos se mencionan terapias de apoyo intensivo, incluyendo líquidos intravenosos y medicamentos para el control de la fiebre o el dolor. Se podrán dar antibióticos para cualquier infección bacteriana secundaria.

¿Me puedo yo vacunar contra el virus West Nile?

Actualmente no existe una vacuna para el virus West Nile pero, hay varias compañías que están trabajando para desarrollar una vacuna.

¿Es éste un virus de temporada?

Los casos de encefalitis West Nile usualmente acontecen a fines del verano o a principios del otoño. Sin embargo, Texas tiene una variedad de climas y, cuando las temperaturas son templadas, el virus West Nile se puede transmitir todo el año. Lo mejor es tratar de protegerse durante todo el año.

¿Qué probabilidades hay en que me pique un zancudo infectado?

Menos del 1% de las personas a quienes les pican los zancudos infectados se enferman severamente. Si usted tiene los síntomas que se mencionan en este folleto, consulte a su médico inmediatamente.

¿Dónde puedo obtener más información?

Póngase en contacto con su departamento de salud local. Información adicional sobre el virus West Nile puede encontrarse en el sitio de Internet del Texas Department of Health en www.tdh.state.tx.us y en el sitio de Internet del CDC en www.cdc.gov/ncidod/dvbod/westnile/index.htm.



Frequently Asked Questions WEST NILE VIRUS

Below are answers to frequently asked questions about the West Nile virus received by the Texas Department of Health. Answers to more than 50 frequently asked questions received by the national Centers for Disease Control and Prevention can be found at: <http://www.cdc.gov/ncidod/dvbid/westnile/q&a.htm>

Q. Can dogs, cats and other pets get the West Nile virus?

A. Yes. But they rarely, if ever, get sick. No cases of West Nile disease have been confirmed in dogs and cats. The virus can infect many species of animals, but few actually get the disease. Most infections have been identified in birds, but West Nile virus has been shown to infect dogs, cats, horses and domestic rabbits, as well as bats, chipmunks, skunks and squirrels.

Q. Is there a vaccine for dogs, cats or horses?

A. There is not a vaccine for dogs and cats. But there is an effective vaccination available for horses.

Q. How many human cases have there been in the United States? How many deaths?

A. In 1999, 62 cases of severe disease, including seven deaths, occurred in the New York area. In 2000, 21 cases were reported, including two deaths in the New York City area. In 2001, there were 66 human cases of severe disease and nine deaths. No reliable estimates are available for the number of cases worldwide of West Nile encephalitis, the disease caused by the West Nile virus.

For 2002 in the United States, there have been numerous cases of human disease due to West Nile virus infection reported to CDC. The latest count of human cases in the United State can be found on CDC's Web site at <http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>.

For the latest up-to-date information, go to http://cindi.usgs.gov/hazard/event/west_nile/west_nile.html and read the summaries.



Q. How many human cases have there been in Texas? How many deaths?

A. The first human death in Texas occurred on August 16, 2002. For the latest up-to-date information on human cases in Texas, see the TDH West Nile Virus home page at <http://www.tdh.state.tx.us/zoonosis/diseases/arboviral/westnile>.

Q. What is the risk of someone becoming infected with West Nile?

A. The risk is very low. Even in areas where the virus is circulating, very few mosquitoes are infected with the virus. Even if the mosquito is infected, less than 1 percent of people who get bitten and become infected will get severely ill. The chances you will become severely ill from any one mosquito bite are extremely small.

Q. Where in Texas has the virus been found?

A. For the most up-to-date information, go to <http://www.tdh.state.tx.us/zoonosis/diseases/arboviral/westNile>.

Q. Do birds or mosquitoes get it first? Where does the virus live?

A. This is a chicken and egg question. It is usually found first in birds. Generally, our surveillance finds the virus in birds a week or two before finding positive mosquitoes. The virus is in their bloodstream. Mosquitoes become infected when they feed on infected birds. The infected mosquitoes can then transmit West Nile virus to humans and animals while biting to take blood. The virus is located in their salivary glands and, during blood feeding, the virus can be injected into the animal or human, where it can multiply, possibly causing illness in the animal or human.

Q. In addition to being infected by the West Nile virus, what else can cause bird “die-offs”?

A. Chemical spills, pesticides, drought, severe weather, food and other diseases.



Q. What's an arbovirus?

A. Any of various viruses that are the causative agents of encephalitis, yellow fever and dengue and that are transmitted chiefly by arthropods, such as insects.

Q. What kind of laboratory tests are done to identify the West Nile virus?

A. Various tests can be done. The type of test will vary among mosquitoes, humans and horses. The type of test also depends on the kind of samples available (blood serum, cerebrospinal fluid, brain tissue). Samples may be tested to find antibodies to West Nile virus, or there may be an attempt to isolate virus particles from the sample. More details are available in the Response Plan at <http://www.tdh.state.tx.us/zoonosis/diseases/arboviral/westnile>.

Q. Is there a human vaccine?

A. No, but several companies are working toward developing a vaccine.

Q. Can a human get the virus twice?

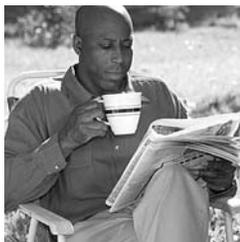
A. We don't think so. It is assumed that a person would develop a natural immunity to future infection by the virus, and that this immunity would be lifelong. However, this immunity may wane in later years.



Remember the “Four D’s” to defend yourself against West Nile virus.



DUSK/DAWN are the times of day you should try to stay indoors. This is when infected mosquitoes are most active.



DRESS in long sleeves and pants when you're outside. For extra protection, you may want to spray thin clothing with repellent.



DEET (N, N-diethyl-m-toluamide) is an ingredient to look for in your insect repellent. Follow label instructions, and always wear repellent when outdoors.



DRAIN standing water in your backyard and neighborhood – old tires, flowerpots and clogged rain gutters. These are mosquito breeding sites.

Fewer than 1 percent of those bitten by infected mosquitoes become severely ill. If you have symptoms that include stiff neck, high fever or severe headache, contact your health-care provider immediately.

ProtectTexas™
Texas Department of Health

texaswestnile.org • 1-888-883-9997



Defiéndase usted del virus West Nile (virus del Nilo Occidental).



DENTRO de la casa, trate de permanecer al anochecer y al amanecer. Estas son las horas cuando los zancudos infectados se encuentran más activos.



DEBE usar pantalones y camisas de manga larga cuando esté a la intemperie. Para mayor protección, puede rociar las ropas delgadas con repelente.



DEET (N, N-diethyl-m-toluamide) es el ingrediente que debe contener el repelente para insectos. Siga las instrucciones de la etiqueta y, al estar a la intemperie utilice siempre repelente.



DESAGÜE las aguas estancadas de su patio y vecindario – en llantas viejas, macetas y canales de desagüe tapados. Estos son los lugares donde se crían los zancudos.

Menos del 1% de las personas a quienes les pican los zancudos infectados se enferman severamente. Si usted tiene síntomas que incluyen la rigidez en el cuello, fiebre alta o dolor de cabeza severo, consulte a su proveedor de atención de salud inmediatamente.

Su Salud
Nuestra Misión™
Texas Department of Health

texaswestnile.org • 1-888-883-9997



Contact Information

Get accurate and reliable information from the experts at the Texas Department of Health. If you suspect West Nile Virus in your community contact the resources below. TDH personnel are prepared to help you protect yourself against West Nile Virus.

Contact the experts at TDH directly:

- Joe Garrett, D.V.M., M.P.H. – Zoonosis Control Division, 512-458-7255
- Eric Fonken, D.V.M., M.P.A. ff. – Zoonosis Control Division, 512-458-7255
- Jim Schuermann, B.S. – Zoonosis Control Division, 512-458-7255
- Roy G. Burton, B.C.E., R.S. – General Sanitation Division, 512-834-6600, ext. 1-2302

If you find a dead bird or suspect that one of your animals may have the virus, contact these local resources:

Texas Department of Health – Regional Zoonosis Control Offices (dead bird surveillance, other surveillance activities, suspect human cases)

Region 1	Canyon	806-655-7151
Region 2/3	Arlington	817-264-4920
Region 4/5N	Tyler	903-533-5212
Region 6/5S	Houston	713-767-3300
Region 7	Temple	254-778-6744
Region 8	Uvalde	830-278-7173
Region 9/10	El Paso	915-834-7781
Region 11	Harlingen	956-444-3224



Texas Department of Health - Regional Environmental Health Offices
(mosquito control)

Region 1	Lubbock	806-744-3577
Region 2/3	Arlington	817-264-4564
Region 4/5N	Tyler	903-595-3585
Region 6/5S	Houston	713-767-3258
Region 7	Temple	254-778-6744
Region 8	Uvalde	830-278-7173
Region 9/10	El Paso	915-834-7715
Region 11	Harlingen	956-423-0130

Texas Department of Health – Laboratory (human diagnostic samples),
512-458-7592 or 512-458-7515

Texas Animal Health Commission (equine cases or suspects), 800-550-8242;
or Texas Veterinary Services, 512-916-5552

Texas Veterinary Medical Diagnostic Laboratory (equine diagnostic samples),
888-646-5623

Texas Department of Health— Web site for current maps and other information
such as symptoms, sample submission, and protective measures,
www.tdh.state.tx.us/zoonosis/



Online Resources

Texas Department of Health:

www.tdh.state.tx.us/zoonosis/diseases/Arboviral/westNile/default.asp

- Frequently asked questions:
www.tdh.state.tx.us/zoonosis/diseases/Arboviral/westNile/information/wnFaq.asp
- Local West Nile contacts:
www.tdh.state.tx.us/zoonosis/diseases/Arboviral/westNile/information/contacts.asp
- Statistics:
www.tdh.state.tx.us/zoonosis/diseases/Arboviral/westNile/statistics/stats.asp
- Symptoms: www.tdh.state.tx.us/zoonosis/diseases/Arboviral/westNile/information/wnFact.asp
- Cases by county for 2002:
www.tdh.state.tx.us/zoonosis/diseases/Arboviral/westNile/statistics/stats.asp?year=2002
- Bird Identification—Grackle or Crow: www.tdh.state.tx.us/zoonosis/diseases/Arboviral/westNile/samples/grackle.asp
- Laboratory: www.tdh.state.tx.us/lab/default.htm
- Human Cases in U.S.:
www.cindi.usgs.gov/hazard/event/west_nile/west_nile.html

Center for Disease Control and Prevention:

www.cdc.gov/ncidod/dvbid/westnile/index.htm

- Overview: www.cdc.gov/ncidod/dvbid/westnile/qa/overview.htm
- Background: www.cdc.gov/ncidod/dvbid/westnile/background.htm
- Q&A: www.cdc.gov/ncidod/dvbid/westnile/q&a.htm
- Prevention Tips: www.cdc.gov/ncidod/dvbid/westnile/index.htm#prevention
- Related Publications: www.cdc.gov/ncidod/dvbid/westnile/publications.htm
- Frequently asked questions: www.cdc.gov/ncidod/dvbid/westnile/q&a.htm
- Insect Repellent Safety: www.cdc.gov/ncidod/dvbid/westnile/qa/insect_repellent.htm



Center for Disease Control and Prevention continued

- Links to state and local sites:
www.cdc.gov/ncidod/dvbid/westnile/city_states.htm
- Statistics, Surveillance and Control:
www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm
- Education and Training: www.cdc.gov/ncidod/dvbid/westnile/education.htm
- Clinical Guidance: www.cdc.gov/ncidod/dvbid/westnile/clinical_guidance.htm
- Ecology and Virology: www.cdc.gov/ncidod/dvbid/westnile/ecology.htm
- Conferences: www.cdc.gov/ncidod/dvbid/westnile/conf/index.htm
- Who is at Risk: www.cdc.gov/ncidod/dvbid/westnile/qa/who_risk.htm
- Symptoms: www.cdc.gov/ncidod/dvbid/westnile/qa/symptoms.htm
- Laboratory Guidance: www.cdc.gov/ncidod/dvbid/westnile/lab_guidance.htm
- Arbovirus Information: www.cdc.gov/ncidod/dvbid/arbtor/arboguid.htm

Environmental Protection Agency:

- Insect Repellent Information: www.epa.gov/pesticides/factsheets/insectrp.htm
- DEET Information: www.epa.gov/pesticides/factsheets/chemicals/deet.htm
- Mosquito Control Fact Sheets: www.epa.gov/oppsrrd1/op/malathion/index.html

NPIC (National Pesticide Information Center) West Nile Virus Resource Guide:

www.ace.orst.edu/info/npic/wnv/

- WNV Background Info: www.ace.orst.edu/info/npic/wnv/background.htm
- WNV and Your Health: www.ace.orst.edu/info/npic/wnv/virus.htm
- WNV Mosquitoes: www.ace.orst.edu/info/npic/wnv/mosquito.htm
- Veterinary/Wildlife: www.ace.orst.edu/info/npic/wnv/veterinary.htm
- Pesticides and Toxicology: www.ace.orst.edu/info/npic/wnv/pesticides.htm
- State Information: www.ace.orst.edu/info/npic/wnv/states.htm
- Federal Information: www.ace.orst.edu/info/npic/wnv/federal.htm
- International Information: www.ace.orst.edu/info/npic/wnv/international.htm
- Maps and Statistics: www.ace.orst.edu/info/npic/wnv/mapstatistics.htm



National Wildlife Health Center, USGS:

www.nwhc.usgs.gov/research/west_nile/west_nile.html

- Maps: www.nwhc.usgs.gov/research/west_nile/wnv_map.html
- Fact Sheets: www.nwhc.usgs.gov/research/west_nile/.html#factsheets
- USGS Wild Life Health Alerts:
www.nwhc.usgs.gov/research/west_nile/west_nile.html#wha
- Species Affected by WNV: www.nwhc.usgs.gov/research/west_nile/wnvaffected.html
- Media Releases:
www.nwhc.usgs.gov/research/west_nile/west_nile_media.html
- State Links: www.nwhc.usgs.gov/research/west_nile/wnv_other.html#state
- FAQ Page: www.nwhc.usgs.gov/research/west_nile/WNV_FAQ.html
- Patuxent Bird Identification InfoCenter: www.mbrpwrc.usgs.gov/Infocenter/

U.S. Department of Agriculture:

www.aphis.usda.gov/lpa/issues/wnv/wnv.html

- Update on Current Status: www.aphis.usda.gov/lpa/issues/wnv/wnvstats.html
- Equine Cases: www.aphis.usda.gov/lpa/issues/wnv/eqimap02.html
- Prevention and Control of Infection:
www.aphis.usda.gov/lpa/issues/wnv/prv.html
- Guidelines: www.aphis.usda.gov/lpa/issues/wnv/wnvguide.html
- WNV in U.S. in 2000:
www.aphis.usda.gov/lpa/issues/wnv/summary2000.html
- WNV in U.S. in 1999: www.aphis.usda.gov/vs/ep/WNV/summary.html
- Factsheet: www.aphis.usda.gov/lpa/pubs/fsheet_faq_notice/fs_ahwnv.html
- Q&A: www.aphis.usda.gov/lpa/pubs/fsheet_faq_notice/faq_ahwnv.html

National Biological Information Infrastructure (NBII):

www.westnilevirus.nbii.gov/

- Latest News: www.westnilevirus.nbii.gov/newsarchive_2002.html
- Human Health and the WNV: www.westnilevirus.nbii.gov/human.html
- Animals and the WNV: www.westnilevirus.nbii.gov/wildlife.html
- Mosquito Control: www.westnilevirus.nbii.gov/mosquitoes.html
- State and Regional Information:
www.westnilevirus.nbii.gov//states/index.html
- Frequently Asked Questions: www.westnilevirus.nbii.gov/faq.html



Texas Animal Health Commission (TAHC):

www.tahc.state.tx.us/

- Press Releases and Information:
www.tahc.state.tx.us/animal_health/diseases/wnv/wnv.shtml

Texas Parks and Wildlife Department (TPWD):

www.tpwd.state.tx.us/

- Facts for Concerned Texans: www.tpwd.state.tx.us/nature/birding/westnilevirus/
- TPW News: www.tpwd.state.tx.us/news/news/020819d.htm
- Texas Jays and Crows:
www.tpwd.state.tx.us/nature/wild/birds/txchecklist/jay.htm

Houston Department of Health and Human Services:

<http://www.ci.houston.tx.us/departme/health/Epidemiology/epicorner-westnile.html>

American Veterinary Medical Association:

<http://www.avma.org/pubhlth/default.asp#wnv>

- Frequently Asked Questions:
www.avma.org/communications/brochures/wnv/wnv%5Ffaq.asp
- Safety Tips: www.avma.org/press/piwestnilevirus_020815.asp
- Brochure: www.avma.org/communications/brochures/default.asp#wnv

United States Geologic Survey site with west Nile maps:

www.cindi.usgs.gov/hazard/event/west_nile/west_nile.html



Mosquitoes That Carry West Nile Virus

Two types of mosquitoes are known to carry St. Louis Encephalitis, West Nile Virus, and Western Equine Encephalitis.

These mosquitoes are the *Culex quinquefasciatus* Say (Southern House Mosquito) and the *Culex tarsalis* Coquillett. Because they carry and are able to transfer these diseases, they are called **vectors**, that is, the means by which disease is transmitted. Here is more information on these types of mosquitoes.

Culex quinquefasciatus Say

(Also known as the Southern House Mosquito)

Medical Importance: This mosquito is a vector of St. Louis Encephalitis (SLE), Western Equine Encephalitis (WEE) and West Nile Virus (WNV) in Texas.

Description: The adult mosquito is brown, medium-sized, and has a blunt abdomen. There are basal bands of white scales on the abdominal segments. There are no other prominent markings.

Breeding Sites: Mosquitoes breed in clear or foul water found in storm-sewer catch basins, poorly-drained street gutters, polluted ground pools, cesspools, open septic tanks, effluent surfacing from septic tank drain fields, drains from sewage disposal plants and in all types of artificial containers that have water with high organic matter.

Life Cycle: The adult female mosquitoes lay their eggs in clusters of 50 to 400 that float on the surface of the water. The eggs hatch within a day or two in warm weather. Usually 8 to 10 days are required for the completion of the larval and pupal stages. Breeding continues throughout the year in Texas with the greatest numbers of mosquitoes being produced in the summer months. The females spend the winter in sheltered areas.

Feeding: Female mosquitoes take blood meals at night from birds, animals and humans. Peak feeding times are between dusk and dawn, with the greatest feeding times usually occurring two hours after sunset. They display a preference for bird blood but will readily feed on humans and animals. They rest during the day in and around houses, outbuildings and various shelters near the breeding sites.



Flight range: Mosquitoes generally migrate only short distances from their breeding sites. Host seeking flights can be as far as 2.5 miles from their breeding sites.

Control:

Habitat Modification – Remove or eliminate as many of the breeding sites as possible.

Biological Control – Use the mosquito fish, *Gambusia affinis*.

Chemical Suppression

Larvacide – Apply in strict accordance with label instructions to those breeding sites that cannot be either removed, eliminated or biological control is not feasible. Larvacides include the bacteria *Bacillus thuringiensis* subspecies *israelensis* or *Bacillus sphaericus*, insect growth regulators, oils, films and insecticides. If an insecticide is used, NEVER use the same class of insecticide for the larvacide and the adulticide in your mosquito control program.

Adulticide – Apply insecticides in strict accordance with label instructions. Apply the insecticide between dusk and dawn when the mosquito is most active.

Culex tarsalis Coquillett

Medical Importance: Vector of St.Louis Encephalitis (SLE), Western Equine Encephalitis (WEE) and West Nile Virus (WNV).

Description: Adult is a medium size mosquito with a white median band on the proboscis, white bands overlapping the tarsal joints, white longitudinal stripes on the femoral and tibial segments of the middle legs, dark chevrons on the ventral aspects of the abdominal segment and white scaling at the antennae base.

Breeding sites: Clear or foul water in ditches, irrigation tail water, ground pools, marshes, pools in steambeds, hoof prints and playa lakes.

Life cycle: Adult female mosquitoes lay their eggs in clusters or rafts of up to 300 that float on the surface of the water. The eggs hatch within a day or two in warm weather. Development is temperate dependent. Usually 4 to 10 days are required for the completion of the larval and pupal stages in the summer. Breeding continues throughout the year in Texas with the greatest numbers of mosquitoes being produced in the late summer months. The females over winter in sheltered areas.



Feeding: Females take blood meals at night with peak feeding times being between dusk and dawn. When mosquito abundance numbers are low in the spring, the females display a preference for bird blood. During late summer when mosquito abundance is high, females prefer to take blood meals from rabbits, horses, cattle and people. They rest during the day in tree cavities, animal burrows, outbuildings and various shelters near the breeding sites.

Flight range: Host seeking flights can be 5 miles or more from the breeding sites.

Control: Sanitation and Habitat Modification – Remove or eliminate as many of the breeding sites as possible.

Biological Control – Use the mosquito fish, *Gambusia affinis*.

Chemical Suppression

Larvacide – Apply in strict accordance with label instructions to those breeding sites that cannot be either removed, eliminated or biological control is not feasible. Larvacides, include the bacteria *Bacillus thuringiensis* subspecies *israelensis* or *Bacillus sphaericus*, insect growth regulators, oils, films and insecticides. If an insecticide is used, NEVER use the same class of insecticide for the larvacide and the adulticide in your mosquito control program.

Adulticide – Apply in strict accordance with label instructions. Apply the insecticide between dusk and dawn when the mosquito is most active.

For additional information, contact the:
Texas Department of Health
General Sanitation Division (512) 834-6635
1100 West. 49th St.
Austin, Texas 78756- 3199



The 10 Most Frequently Asked Questions About Mosquitoes

- 1. How many species of mosquitoes are in the world?** *About 2,700.*
- 2. How much blood does a female mosquito drink per serving?**
About 5-millionths of a liter.
- 3. What is the average number of mosquito bites a person receives before taking an action?** *Three.*
- 4. How do mosquitoes find new hosts?** *By sight; by detecting infrared radiation; by chemical signals.*
- 5. How fast can a mosquito fly?** *About 1 to 1.5 miles per hour.*
- 6. How soon can a female mosquito transmit West Nile virus after taking an infected blood meal?** *About 10-14 days.*
- 7. How far away can a mosquito smell a human, a cow, a horse, or another host?** *Between 20 to 35 meters (60 to 105 feet).*
- 8. What color clothes are mosquitoes most attracted to?** *Dark colors.*
- 9. What is the most effective protection against biting insects?** *DEET*
- 10. How well do bug zappers work?** *Studies show that they actually attract mosquitoes into your yard.*



Integrated Pest Management Program for Mosquito Control

A mosquito control program should be based on the Principles of Integrated Pest Management (IPM). These principles of IPM are knowledge of the mosquito bionomics and the epidemiology of mosquito-borne disease when it is necessary; survey and monitoring effort for the detection and status assessment of mosquitoes and/ or mosquito-borne disease; multi-tactic prevention and control program comprised of a system of control tactics which are compatible with each other and which are proven for their effectiveness against the mosquito and/ or mosquito-borne disease; continuous program evaluation and update so as to ensure the best methods are being used to meet the prevention and control objectives of the program and continued education of the public to create awareness, understanding and support. The professional and technical staff involved should also be kept current on the technology, tactics and rules and regulations that pertain to the program and its safe and effective execution.

The control tactics that are used in an IPM program for mosquito control include sanitation, habitat disruption, biological control, mechanical control, personal protection and chemical suppression.

Key Elements in an IPM Mosquito Control Program Include:

- 1.** The thorough investigation of each complaint to be sure that the insects involved are actually mosquitoes, and not midges, crane flies, or other non-biting insects which do not warrant control. Collected adult mosquitoes should be identified to species to determine their potential significance as vectors of disease and to assist in locating their breeding sites. Specimens may be sent to the Vector Control Branch, General Sanitation Division or to the Bureau of Laboratories, Texas Department of Health, 1100 West 49th Street, Austin, Texas 78756 for identification.
- 2.** Frequent sampling and careful mapping of all potential mosquito breeding areas in order that a minimal amount of time will be needed to pinpoint the source of each brood of mosquitoes and to facilitate habitat disruption and/or larvaciding operations.



3. The use of appropriate larval control agents in mosquito breeding sites that cannot be eliminated. These include the use of mosquito fish (*Gambusia affinis*), the application of insect growth regulators and/or microbial agents specific to mosquitoes applied by TDH licensed certified pesticide applicators.
4. Insecticides applied with a ULV aerosol generator or with thermal fogs by TDH licensed certified pesticide applicators to kill adult mosquitoes that have escaped other control measures or have infiltrated from outside the control area. To be effective, the insecticide must be applied in the right place and at the right time rather adhering to a rigid schedule, which provides for treatment of a specified area on a particular day of the week whether or not a need actually exists at the scheduled time. Adulticiding operations do not depend on toxic residues for their effectiveness; the insecticide particles must impinge on the adult mosquito in order to kill it. It is essential, therefore, that insecticides be applied when the adult mosquitoes are active.
5. Routine pre-treatment and post-treatment inspection of treated areas to permit an accurate determination of treatment effectiveness. This also permits rapid identification and correction of the causes of control failures.
6. Periodic testing of the local mosquito populations to determine if they are resistant to the insecticides being used in the mosquito control program.
7. Regular maintenance and frequent calibration of all insecticide application equipment in accordance with manufacturer's recommendations.
8. The use of all insecticides under the direction and control of TDH licensed certified pesticide applicators in strict compliance with all label directions and precautions.
9. An accurate record of all inspections and insecticide treatments. Insecticide use records must be kept for five years.
10. Educational activities to assure that each member of the staff remains abreast of current mosquito control technology. Staff personnel should present educational programs to the public as time permits, since an informed public is essential to the control of mosquito breeding sources on private property. The pamphlet *Stop Raising Mosquitoes in Your Yard and Home* is available in quantity for your use in this regard.

For additional information contact:

General Sanitation Division
Texas Department of Health
1100 West 49th Street
Austin, Texas 78756
512-834-6635



2002 County Data

The purpose of surveillance by the Texas Department of Health is to try to detect where disease organisms, such as bacteria and viruses, might be located in Texas. This type of surveillance is basically an active observation or watch for disease organisms. For example, when trying to find if a certain virus carried by mosquitoes is in Texas, mosquitoes are collected and sent to the lab for testing. If a mosquito is positive, it means that the virus was found during testing. If a mosquito is negative, it means that the virus was not found during testing. Similar surveillance is conducted on other insects and samples from animals for a variety of diseases.

The amount of testing in the surveillance process will vary for different counties statewide. If a report indicates that an area does not have any positive test results for a particular disease, it does not necessarily mean that the disease organisms are not in that area. It just reflects that no positive tests on collected insects or samples have been reported from that area.

Confirmed West Nile Cases for Year 2002

County	Bird	Human*	Mosquito	Horse
Anderson	1	0	0	2
Andrews	0	0	0	1
Angelina	0	0	0	3
Aransas	0	0	0	2
Archer	1	0	0	15
Armstrong	0	0	0	15
Atascosa	0	0	0	1
Austin	1	0	0	1
Bailey	0	0	0	2
Bandera	0	0	0	1
Bastrop	1	0	0	3
Baylor	1	0	0	3
Bee	0	0	0	4
Bell	3	0	0	7
Bexar	14	0	0	7
Blanco	0	0	0	2
Bosque	0	0	0	4
Bowie	6	1	0	3
OBrazoria	0	0	1	2
Brazos	3	0	13	2
Brewster	0	0	0	5
Briscoe	0	0	0	11
Brooks	0	0	0	2

*There were thirteen deaths among those who contracted West Nile Illness in 2002.

County	Bird	Human	Mosquito	Horse
Brown	1	0	0	12
Burleson	0	0	0	2
Burnet	0	0	0	10
Caldwell	0	1	0	6
Calhoun	1	0	0	0
Callahan	0	1	0	12
Cameron	0	0	0	4
Camp	2	0	0	0
Carson	0	0	0	8
Cass	17	0	0	1
Castro	0	0	0	17
Chambers	0	0	0	8
Cherokee	0	0	0	2
Childress	0	1	0	3
Clay	0	0	0	10
Cochran	0	0	0	1
Coke	0	0	0	5
Coleman	0	0	0	3
Collin	4	1	0	18
Collingsworth	0	0	0	2
Colorado	2	0	0	0
Comal	1	0	0	2
Comanche	3	0	0	14
Cooke	0	0	0	17
Coryell	3	0	0	11
Cottle	0	0	0	7
Crosby	0	3	0	6
Dallam	0	0	0	9
Dallas	28	25	42	26
Dawson	0	0	0	7
Deaf Smith	0	0	0	19
Delta	0	0	0	1
Denton	9	2	1	69
Dickens	0	0	0	7
Donley	2	0	0	6
Duval	0	0	0	4
Eastland	0	0	0	17
Ector	0	0	0	11
Edwards	0	0	0	3
El Paso	0	0	1	0



County	Bird	Human	Mosquito	Horse
Ellis	2	1	0	21
Erath	0	0	0	36
Falls	0	0	0	3
Fannin	6	0	0	7
Fayette	0	0	0	3
Fisher	0	0	0	6
Floyd	0	1	0	9
Fort Bend	1	0	1	5
Franklin	0	0	0	1
Freestone	0	0	0	1
Frio	0	0	0	2
Galveston	1	1	4	7
Garza	0	0	0	4
Gillespie	0	0	0	1
Glasscock	0	0	0	1
Goliad	0	0	0	1
Gonzales	0	0	0	3
Gray	0	0	0	12
Grayson	1	0	0	8
Gregg	2	0	2	0
Grimes	0	0	0	1
Guadalupe	0	0	0	2
Hale	0	2	0	15
Hall	0	0	0	5
Hamilton	0	0	0	10
Hansford	0	0	0	10
Hardeman	0	1	0	2
Hardin	0	0	0	10
Harris	308	105	86	53
Harrison	1	0	0	0
Hartley	0	0	0	7
Haskell	3	1	0	7
Hays	0	0	0	5
Hemphill	0	0	0	2
Henderson	0	0	0	5
Hidalgo	0	1	0	0
Hill	1	0	0	5
Hockley	0	0	0	16
Hood	0	1	0	27
Hopkins	1	0	0	0



County	Bird	Human	Mosquito	Horse
Houston	2	0	0	1
Howard	0	0	0	1
Hudspeth	0	0	0	1
Hunt	6	0	0	15
Hutchinson	0	0	0	7
Jack	0	0	0	5
Jasper	0	1	0	2
Jefferson	0	8	38	8
Jim Wells	0	0	0	5
Johnson	5	1	0	30
Jones	1	1	0	21
Karnes	0	0	0	4
Kaufman	1	0	0	9
Kendall	0	0	0	2
Kerr	0	0	0	2
Kimble	0	0	0	2
Kinney	0	0	0	1
Kleberg	0	0	0	1
Knox	0	0	0	7
La Salle	0	0	0	1
Lamar	2	0	0	3
Lamb	0	0	0	5
Lampasas	0	0	0	13
Lee	0	0	0	3
Leon	0	0	0	1
Liberty	0	0	0	8
Limestone	0	0	0	3
Lipscomb	0	0	0	4
Live Oak	0	0	0	3
Llano	0	0	0	3
Lubbock	0	0	0	38
Lynn	0	0	0	4
Mason	0	0	0	2
Maverick	0	0	0	1
McCulloch	0	0	0	2
McLennan	3	4	0	29
Medina	0	0	0	5
Menard	0	0	0	1
Midland	0	0	0	7
Milam	0	0	0	3



County	Bird	Human	Mosquito	Horse
Mills	0	0	0	4
Montague	0	0	0	24
Montgomery	6	7	0	29
Moore	0	0	0	13
Morris	0	0	0	1
Motley	0	0	0	2
Nacogdoches	6	1	0	6
Navarro	0	0	0	6
Newton	0	0	0	1
Nolan	0	0	0	5
Nueces	0	2	63	6
Ochiltree	0	0	0	5
Oldham	0	0	0	4
Orange	0	8	3	12
Palo Pinto	0	0	0	7
Parker	0	0	0	49
Parmer	0	0	0	5
Pecos	0	0	0	2
Polk	0	0	0	1
Potter	1	1	0	20
Presidio	0	0	0	1
Randall	2	3	0	59
Red River	0	0	0	3
Reeves	0	0	0	1
Roberts	0	0	0	3
Rockwall	0	0	0	6
Runnels	0	0	0	1
Rusk	0	1	0	1
Sabine	0	0	0	1
San Jacinto	0	0	0	1
San Patricio	0	0	0	4
San Saba	0	0	0	4
Scurry	0	0	0	5
Shackelford	0	0	0	4
Shelby	3	0	0	3
Sherman	0	0	0	11
Smith	3	0	0	4
Somervell	0	0	0	3
Starr	0	0	0	2
Stephens	0	1	0	3



County	Bird	Human	Mosquito	Horse
Stonewall	0	1	0	13
Swisher	0	0	0	14
Tarrant	5	5	3	46
Taylor	19	4	0	63
Terry	1	0	0	2
Throckmorton	0	0	0	3
Titus	1	0	0	6
Tom Green	0	1	0	6
Travis	1	1	0	12
Trinity	0	1	0	1
Upton	0	0	0	1
Uvalde	0	0	0	6
Val Verde	0	0	0	2
Van Zandt	1	0	0	5
Walker	2	1	0	0
Waller	1	0	0	2
Washington	0	0	0	5
Webb	0	0	0	4
Wharton	2	0	0	1
Wheeler	1	0	0	8
Wichita	5	0	1	36
Wilbarger	1	0	0	9
Willacy	0	0	0	2
Williamson	1	0	0	29
Wilson	0	0	0	4
Wise	1	0	0	41
Wood	2	0	0	3
Young	2	0	0	14
Zapata	0	0	0	2
Zavala	0	0	0	1
Total	518	202	259	1,697



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